REMARKS

Claims 24-27, 31-33 and 35-46 are pending in this application. Claim 24 is amended to incorporate the subject matter of claims 28-30 and 34 and to better conform to U.S. claim practice. Claims 28-30 and 34 are canceled. Claims 31 and 35-40 are amended for antecedent basis. Claim 42 is amended to replace "consisting" with "comprising," and finds support in the specification as filed at page 9, lines 12-23 and page 10, line 26 through page 11, line 26. Claim 42 is further amended to better conform to U.S. claim practice. No new matter is added by this Amendment.

The courtesies extended to Applicants' representative by Examiner Cullen and Supervisory Examiner Ridley at the interview held August 20, 2009, are appreciated. The reasons presented at the interview as warranting favorable action are incorporated into the remarks below, which constitute Applicants' record of the interview.

I. Rejection Under 35 U.S.C. §112, Second Paragraph

The Office Action rejects claims 40 and 41 under 35 U.S.C. §112, second paragraph, as allegedly failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants respectfully traverse this rejection.

A. Claim 40

The Patent Office alleges that it is unclear "how the concentrations of the constituents of the first electrode, $A_{x1}T_{y1}[XY_1Y_2Y_3Y_4]_{z1}B_{w1}$, can vary from 0 to 1 from the electrolyte to the first electrode while the constituents of the electrolyte, $[XY_1Y_2Y_3Y_4]$, vary from 1 to 0 from the electrolyte to the first electrode". Applicants respectfully submit that the Patent Office has misconstrued the claims.

Because claim 24 (and therefore claim 40) recites that the first electrode comprises a compound $A_{x1}T_{y1}[XY_1Y_2Y_3Y_4]_{z1}B_{w1}$ and that the electrolyte comprises grouping

$[XY_1Y_2Y_3Y_4]$, all the constituents of the first electrode and the electrolyte are not required to be the same. The grouping $[XY_1Y_2Y_3Y_4]$ of the electrolyte is not the same as compound $A_{x1}T_{y1}[XY_1Y_2Y_3Y_4]_{z1}B_{w1}$ of the first electrode, even if the $XY_1Y_2Y_3Y_4$ portions are the same.

As acknowledged by the Examiners during the interview, even if the respective constituents of the electrolyte and the first electrode have a common grouping $[XY_1Y_2Y_3Y_4]$, all the constituents of the first electrode and the electrolyte are not required to be identical, and therefore the constituents of the first electrode and the electrolyte can have different concentrations varying in opposition in the first intermediate thin layer.

As such, Applicants respectively submit that claim 40 is definite.

B. Claim 41

The Patent Office alleges that it is unclear "how the concentrations of the constituents of the second electrode, $A_{x2}T'_{y2}[X'Y'_1Y'_2Y'_3Y'_4]_{z2}B'_{w2}$, can vary from 0 to 1 from the electrolyte to the second electrode while the constituents of the electrolyte, $[X'Y'_1Y'_2Y'_3Y'_4]$, vary from 1 to 0 from the electrolyte to the second electrode". Applicant respectfully submits that the Patent Office has misconstrued the claims.

Because claim 31 (and therefore claim 41) recites that the second electrode comprises a compound $A_{x2}T'_{y2}[X'Y'_1Y'_2Y'_3Y'_4]_{z2}B'_{w2}$, while claim 24 (amended to include claim 34) requires only that the electrolyte comprise grouping $[X'Y'_1Y'_2Y'_3Y'_4]$, all the constituents of the second electrode and the electrolyte are not required to be the same. The grouping $[X'Y'_1Y'_2Y'_3Y'_4]$ of the electrolyte is not required to be the same as compound $A_{x2}T'_{y2}[X'Y'_1Y'_2Y'_3Y'_4]_{z2}B'_{w2}$ of the second electrode, even if the $[X'Y'_1Y'_2Y'_3Y'_4]$ portions are the same.

As acknowledged by the Examiners during the interview, even if the respective constituents of the electrolyte and of the second electrode have a common grouping ($X'Y'_1Y'_2Y'_3Y'_4$), all the constituents of the second electrode and the electrolyte are not required to be identical and therefore the constituents of the second electrode and the electrolyte can have different concentrations varying in opposition in the second intermediate thin layer.

As such, Applicants respectively submit that claim 41 is definite.

C. Conclusion

For at least the reasons discussed above, Applicants respectfully submit that claims 40 and 41 meet the requirements of 35 U.S.C. §112, second paragraph. Withdrawal of the rejection is respectfully requested.

II. Rejections Under 35 U.S.C. §103(a)

A. Claims 24-27, 31-33 and 35-39

The Office Action rejects claims 24-39 as allegedly being unpatentable over U.S. Patent No. 5,597,660 ("Bates") in view of U.S. Patent Application Publication No. 2003/0027049 ("Barker"). Applicants respectfully traverse this rejection.

Bates discloses an electrolyte (26) for an electrochemical cell, wherein the electrolyte has the composition $Li_xPO_yN_z$. Bates, Abstract and column 3, lines 59-60. The electrolyte is arranged between two electrodes (24) and (28) formed of vanadium-oxide and lithium, respectively. Bates, column 3, lines 42-43 and column 4, lines 14-15. The Patent Office admits that Bates fails to describe a microbattery wherein the first electrode and the electrolyte both comprise at least one common grouping $[XY_1Y_2Y_3Y_4]$, as recited in claim 24, and thus introduces Barker as allegedly describing this feature.

Barker describes electrodes formed of active materials comprising a compound of the formula $Li_aM_b(PO4)Z_d$. Barker, Abstract and paragraph [0045]. Barker further describes a

battery having an electrolyte comprising a polymer matrix containing an ionic conductive medium and a separator. Barker, paragraphs [0150] and [0153].

However, neither Bates nor Barker describe a microbattery wherein the first electrode and the electrolyte both comprise at least one common grouping $[XY_1Y_2Y_3Y_4]$, as recited in claim 24. Bates and Barker require, in every disclosed embodiment, that the electrodes and the electrolyte are formed of different compounds, and thus one of ordinary skill in the art would not have had any reason or rationale to have modified the battery of Bates or Barker to have achieved a microbattery wherein the first electrode and the electrolyte both comprise at least one common grouping $[XY_1Y_2Y_3Y_4]$, as recited in
claim 24.

The microbattery of claim 24, having a certain continuum or homogeneity in the chemical composition of the electrode and the electrolyte (i.e., at least one common grouping $[XY_1Y_2Y_3Y_4]$ between the first electrode and the electrolyte), achieves a low electrical resistance with respect to the thin layers of the electrodes and electrolyte having different chemical compositions and different structures. See specification, page 6, lines 14-21. Therefore, the microbattery of claim 24 is able to achieve reduced electrical resistance and improved storage capacity. See specification, page 6, lines 14-21.

Because Bates and Barker fail to provide one of ordinary skill in the art with any reason or rationale to have selected an electrolyte having a grouping $[XY_1Y_2Y_3Y_4]$ common to the group of the active material of the electrode in order to provide a microbattery presenting a high energy storage capacity and a reduced electrical resistance, Bates and Barker fail to render obvious claim 24.

Additionally, claim 24 has been amended to incorporate the subject matter of claims 28-30 and 34. As such, claim 24 recites a microbattery, wherein the first electrode and the

electrolyte both comprise at least one common grouping [$XY_1Y_2Y_3Y_4$], and the second electrode and the electrolyte both comprise at least one common grouping [$X'Y'_1Y'_2Y'_3Y'_4$]. Bates and Barker fail to describe any continuum between either electrode and the electrolyte, let alone a continuum between each electrode and the electrolyte. For at least this additional reason, Bates and Barker fail to render obvious claim 24.

Accordingly, Bates and Barker, whether taken independently or in concert, fail to render obvious claims 24-27, 31-33 and 35-39. Withdrawal of the rejection is therefore respectfully requested.

B. Claims 40 and 41

The Office Action rejects claims 40 and 41 under 35 U.S.C. §103(a) as allegedly being unpatentable over Bates in view of Barker and further in view of U.S. Patent No. 6,287,716 ("Hashimoto"). Applicants respectfully traverse this rejection.

For at least the reasons discussed above, Bates and Barker fail to render obvious independent claim 24. Thus, Bates and Barker also fail to render obvious dependent claims 40 and 41.

Bates states that one advantage to the thin-film battery described therein is that it does not require a film between the lithium-anode electrode and the electrolyte. Bates, column 4, lines 12-17. Therefore, it would be directly contrary to the teaching of Bates to include a first or second intermediate layer, as recited in claims 40 and 41.

Hashimoto describes a solid oxide fuel cell comprising an electrolyte layer, an air electrode, a fuel electrode and an intermediate layer interposed therebetween. Hashimoto, Abstract and column 2, lines 6-8. However, Applicants respectfully submit that Hashimoto fails to remedy the deficiencies of Bates and Barker discussed above and with regard to claims 40 and 41.

MPEP §2145(X)(D) states that it is improper to combine references if a proposed modification renders the prior art unsatisfactory for its intended purpose. Because Bates specifically states that one advantage of the described thin-film battery is to remove the necessity for a film between the electrode and the electrolyte, it would be directly contrary to the disclosure of Bates to include a first or second intermediate layer in the microbattery, as recited in claims 40 and 41. Thus, Applicants respectfully submit that one of ordinary skill in the art would not have had any reason or rationale to have attempted to combine the disclosures of Bates and Barker with Hashimoto to include an intermediate layer in the thin-film battery of Bates, and thus one of ordinary skill in the art would not have had any reason or rationale to have attempted the microbattery of claims 40 and 41.

Furthermore, Hashimoto is non-analogous art with respect to Bates and Barker. As discussed above, Hashimoto describes a solid oxide fuel cell (Hashimoto, Abstract). However, the solid oxide fuel cell of Hashimoto is not a thin-film battery as described in Bates (Bates, Abstract) or an electrochemical battery as described in Barker (Barker, paragraph [0022]). Therefore, one of ordinary skill in the art would not have had any reason or rationale to have incorporated the disclosure of Hashimoto into the batteries of Bates or Barker.

Additionally, Hashimoto further describes that metals are not appropriate for the air electrode (i.e., cathode), whereas Bates and Barker require that the electrode contain metal. See Hashimoto, column 2, lines 8-11; Bates, column 3, lines 42-44; and Barker, paragraph [0045]. For this additional reason, one of ordinary skill in the art would not have had any reason or rationale to have incorporated the disclosure of Hashimoto into the batteries of Bates or Barker.

Finally, none of the cited references describe an intermediate layer formed between an electrode and an electrolyte wherein the first electrode and the electrolyte comprise at least

one common grouping [$XY_1Y_2Y_3Y_4$] and the second electrode and the electrolyte comprise at least one common grouping [$X'Y'_1Y'_2Y'_3Y'_4$]. As discussed in the specification at page 10, lines 18-24, arranging an intermediate thin layer comprising the same constituents as the electrode and the electrolyte between an electrode and the electrolyte enables the concentration gradient to be reduced in [$XY_1Y_2Y_3Y_4$] grouping for the anode and in [$X'Y'_1Y'_2Y'_3Y'_4$] grouping for the cathode and therefore reduces the electrical resistance at the interface of the electrodes and the electrolyte, which in turn decreases the total electrical resistance of the battery.

Therefore, Applicants respectfully submit that none of Bates, Barker and Hashimoto, whether taken independently or in concert, render obvious claims 40 and 41. Withdrawal of the rejection is respectfully requested.

C. Claims 42, 45 and 46

The Office Action rejects claims 42, 45 and 46 under 35 U.S.C. §103(a) as allegedly being unpatentable over Bates in view of Barker and in further view of U.S. Patent Application Publication No. 2004/0096745 ("Shibano"). Applicants respectfully traverse this rejection.

For at least the reasons discussed above, Bates and Barker fail to render obvious independent claim 24. Thus, Bates and Barker also fail to render obvious dependent claims 42, 45 and 46.

Shibano describes a lithium ion conductor and all-solid lithium ion rechargeable battery that may be produced by forming an electrode film, an electrolyte and then a second electrode, and further discloses that the film formation may be carried out by sputtering, vapor deposition, electron beam deposition, laser abrasion, ion plating, CVD, sol-gel method, screen printing and the like. Shibano, Abstract, and paragraphs [0026], [0027], [0029], [0032] and [0033]. However, Shibano fails to remedy the deficiencies of Bates and Barker

discussed above, at least because Shibano fails to describe a microbattery wherein the first electrode and the electrolyte both comprise at least one common grouping [$XY_1Y_2Y_3Y_4$], as required in claim 24 (from which claims 42, 45 and 46 depend).

Therefore, Bates, Barker and Shibano, whether taken independently or in concert, fail to render obvious claims 42, 45 and 46. Withdrawal of the rejection is respectfully requested.

D. Claim 43 and 44

The Office Action rejects claims 43 and 44 under 35 U.S.C. §103(a) as allegedly being unpatentable over Bates in view of Barker, Shibano and U.S. Patent Application Publication No. 2005/0280118 ("Lin"). Applicants respectfully traverse this rejection.

For at least the reasons discussed above, Bates, Barker and Shibano fail to render obvious claim 42. Thus Bates and Barker also fail to render obvious dependent claims 43 and 44, which depend from claim 42.

Additionally, and as discussed above, Bates and Barker do not render obvious a microbattery having a first and a second intermediate thin layer, at least because Bates disfavors an intermediate layer formed between the electrolyte and an electrode. Bates, column 4, lines 12-17. Thus, Bates and Barker do not render obvious claims 43 and 44, which recite methods for the production of a microbattery including depositing first and second intermediate thin layers, respectively.

Lin describes a method of manufacturing a microelectronic device, such as a transistor gate, by forming an opening in a dielectric layer located over a substrate, forming a semi-conductive layer substantially conforming to the opening, and forming a conductive layer substantially conforming to the semi-conductive layer. Lin, Abstract and paragraphs [0001] and [0002]. However, Lin fails to remedy the deficiencies of Bates and Barker discussed above.

Lin fails to describe a method for production of a microbattery, wherein a first intermediate thin layer is deposited on the second electrode by means of the first and second sputtering targets before deposition of the electrolyte, as recited in claim 43, or wherein a second intermediate thin layer is deposited on the electrolyte by means of the second and third sputtering targets before deposition of the first electrode, as recited in claim 44. Lin merely discloses the formation of a single metal-silicide layer having a metal constituent that may not be uniform in concentration throughout. Lin, paragraph [0062].

Further, while Lin describes co-sputtering employing a metal target and a silicon containing target (Lin, paragraph [0062]), Lin fails to describe depositing a first intermediate layer on the second electrode by means of the first and second sputtering targets, wherein the first sputtering target comprises at least the compound $A_{x2}T'_{y2}[XY_1Y_2Y_3Y_4]_{z2}B'_{w2}$ and the chemical element E' and wherein the second sputtering target comprises at least the grouping $[XY_1Y_2Y_3Y_4]$, as recited in claim 24 (from which claims 43 and 44 depend). Lin also fails to describe a depositing a second intermediate thin layer on the electrolyte by means of the second and third sputtering targets, wherein the second sputtering target comprises at least the grouping $[XY_1Y_2Y_3Y_4]$, and the third sputtering sputtering target comprising at least the grouping $A_{x1}T_{y1}[XY_1Y_2Y_3Y_4]_{z1}B_{w1}$ and the chemical element E, as recited in claim 42 (from which claims 43 and 44 depend).

The varying concentration of the metal constituent of the metal-silicide layer of Lin would not provide one of ordinary skill in the art with any reason or rationale to have attempted the method of claims 43 and 44, because, while Lin describes co-sputtering, Lin fails to describe multiple layers of very specific sputtering target compounds, as recited in claims 43 and 44.

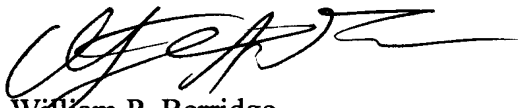
Therefore, for at least the reasons discussed above, Bates, Barker and Lin fail to render obvious claims 43 and 44. Withdrawal of the rejection is respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 24-27, 31-33 and 35-46 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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